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 NEWS  1           Web Page URLs for STN Seminar Schedule - N. America
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                   has been enhanced and reloaded
 NEWS  4  OCT 30   CHEMLIST enhanced with new search and display field
 NEWS  5  NOV 03   JAPIO enhanced with IPC 8 features and functionality
 NEWS  6  NOV 10   CA/CAplus F-Term thesaurus enhanced
 NEWS  7  NOV 10   STN Express with Discover! free maintenance release Version
                   8.01c now available
 NEWS  8  NOV 20   CAS Registry Number crossover limit increased to 300,000 in
                   additional databases
 NEWS  9  NOV 20   CA/CAplus to MARPAT accession number crossover limit increased
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 NEWS 10  DEC 01   CAS REGISTRY updated with new ambiguity codes
 NEWS 11  DEC 11   CAS REGISTRY chemical nomenclature enhanced
 NEWS 12  DEC 14   WPIDS/WPINDEX/WPIX manual codes updated
 NEWS 13  DEC 14   GBFULL and FRFULL enhanced with IPC 8 features and
                   functionality
 NEWS 14  DEC 18   CA/CAplus pre-1967 chemical substance index entries enhanced
                   with preparation role
 NEWS 15  DEC 18   CA/CAplus patent kind codes updated
 NEWS 16  DEC 18   MARPAT to CA/CAplus accession number crossover limit increased
                   to 50,000
 NEWS 17  DEC 18   MEDLINE updated in preparation for 2007 reload
 NEWS 18  DEC 27   CA/CAplus enhanced with more pre-1907 records
 NEWS 19  JAN 08   CHEMLIST enhanced with New Zealand Inventory of Chemicals
 NEWS 20  JAN 16   CA/CAplus Company Name Thesaurus enhanced and reloaded
 NEWS 21  JAN 16   IPC version 2007.01 thesaurus available on STN
 NEWS 22  JAN 16   WPIDS/WPINDEX/WPIX enhanced with IPC 8 reclassification data
 NEWS 23  JAN 22   CA/CAplus updated with revised CAS roles
 NEWS 24  JAN 22   CA/CAplus enhanced with patent applications from India

 NEWS EXPRESS  NOVEMBER 10 CURRENT WINDOWS VERSION IS V8.01c, CURRENT
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=> s (produce or production or produced)(w)(ethanol or alcohol) and fuel or potable or industrial
L1 459270 (PRODUCE OR PRODUCTION OR PRODUCED)(W)(ETHANOL OR ALCOHOL) AND FUEL OR POTABLE OR INDUSTRIAL

=> s (produce or production or produced)(w)(ethanol or alcohol)
L2 1895 (PRODUCE OR PRODUCTION OR PRODUCED)(W)(ETHANOL OR ALCOHOL)

=> s l2 and beer
L3 28 L2 AND BEER

=> d l3 1-28 abs

L3 ANSWER 1 OF 28 MEDLINE on STN
AB Brewing and wine production are among the oldest technologies and their products are almost indispensable in our lives. The central biological agents of ***beer*** and wine fermentation are yeasts belonging to the genus Saccharomyces, which can accumulate ethanol. Recent advances in comparative genomics and bioinformatics have made it possible to elucidate when and why yeasts ***produce*** ***ethanol*** in high concentrations, and how this remarkable trait originated and developed during their evolutionary history. Two research groups have shed light on the origin of the genes encoding alcohol dehydrogenase and the process of ethanol accumulation in Saccharomyces cerevisiae.

L3 ANSWER 2 OF 28 MEDLINE on STN
AB This article presents the advanced technology that has been developed by BioEnergy International of Gainesville, Florida, utilizing novel recombinant strains of bacteria developed by Lonnie Ingram of the University of Florida. The first commercial applications of these unique fermenting organisms convert 5-carbon sugars, as well as 6-carbon sugars, and oligomers of cellulose (e.g., cellobiose and cellotriose) directly to ethanol. The proposed systems that will be utilized for conversion of agricultural wastes, mixed waste papers, and pulp and paper mill waste in forthcoming commercial installations are now under design. This involves

the extensive experience of Raphael Katzen Associates International, Inc. in acid hydrolysis, enzyme production, enzymatic hydrolysis, large-scale fermentation engineering, and distillation/dehydration. Specific examples of this advanced technology will be presented in different applications, namely: 1. Conversion of the hemicellulose content of sugar cane bagasse to 5-carbon sugars by mild-acid prehydrolysis, followed by fermentation of the 5-carbon sugar extract with recombinant Escherichia coli in a commercial installation soon to be under construction in Brazil. This unique process utilizes the surplus hemicellulose fraction of bagasse not required for steam and power generation to ***produce*** ***ethanol*** , additional to that from the original can juice, which has been converted by conventional sucrose fermentation to ethanol. The process also recovers and converts to ethanol the majority of sucrose normally lost with the bagasse fibers. Resultant ***beer*** is enriched in an innovative process to eliminate the need for incremental rectification capacity. 2. Application of this technology to mixed waste paper in Florida, with a moderate loading of newsprint (85% mechanical wood fiber), will involve a mild-acid prehydrolysis, the partial extraction of the 5-carbon sugars produced from hemicellulose as a feedstock for propagation of the recombinant Klebsiella oxytoca bacterium. Included is a facility providing for in-house production of cellulase enzyme, as an active whole broth for direct use in simultaneous saccharification and fermentation (SSF) of the remaining cellulose and residual 5-carbon sugars to ethanol. This is followed by distillation and dehydration in the advanced commercially available low-energy recovery system. 3. Another potential application of this unique technology involves utilization of a variety of wastes from several pulp and paper mills in close proximity, permitting collection of these wastes at low cost and reducing the considerable cost encountered in disposing of such low-energy wet waste.(ABSTRACT TRUNCATED AT 400 WORDS)

L3 ANSWER 3 OF 28 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN
AB Brewing and wine production are among the oldest technologies and their products are almost indispensable in our lives. The central biological agents of ***beer*** and wine fermentation are yeasts belonging to the genus Saccharomyces, which can accumulate ethanol. Recent advances in comparative genomics and bioinformatics have made it possible to elucidate when and why yeasts ***produce*** ***ethanol*** in high concentrations, and how this remarkable trait originated and developed during their evolutionary history. Two research groups have shed light on the origin of the genes encoding alcohol dehydrogenase and the process of ethanol accumulation in Saccharomyces cerevisiae.

L3 ANSWER 4 OF 28 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN
AB Saccharomyces cerevisiae is the main microorganism used in alcoholic beverage brewing, because this microbe has alcohol dehydrogenase (ADH) activity. We have recently discovered that some genera of mushrooms ***produce*** ***alcohol*** dehydrogenase, and made wine, ***beer*** and sake using mushrooms in place of S. cerevisiae. The highest alcohol concentrations in the wine, ***beer*** and sake were achieved with Pleurotus ostreatus (2648 mM, 12.2%), Tricholoma matsutake (1069 mM, 4.6%) and Agaricus blazei (1736 mM, 8.0%). In the case of wine made using A. blazei, the same alcohol concentration (1736 mM, 8.0%) was produced under both aerobic and anaerobic conditions. This wine produced by A. blazei contained about 0.68% beta-D-glucan, which is known to have preventive effects against cancer. The wine made using Flammulina velutipes showed thrombosis-preventing activity, giving a prolonged thrombin clotting time 2.2-fold that of the control. Thus, alcoholic beverages made using mushrooms seem to be a functional food source which can be expected to have preventive effects against cancer and thrombosis.

L3 ANSWER 5 OF 28 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN
AB This article presents the advanced technology that has been developed by

BioEnergy International of Gainesville, Florida, utilizing novel recombinant strains of bacteria developed by Lonnie Ingram of the University of Florida. The first commercial applications of these unique fermenting organisms convert 5-carbon sugars, as well as carbon sugars, and oligomers of cellulose (e.g., cellobiose and cellotriose) directly to ethanol. The proposed systems that will be utilized for conversion of agricultural wastes, mixed waste papers, and pulp and paper mill waste in forthcoming commercial installations are now under design. This involves the extensive experience of Raphael Katzen Associates International, Inc. in acid hydrolysis, enzyme production, enzymatic hydrolysis, large-scale fermentation engineering, and distillation/dehydration. Specific examples of this advanced technology will be presented in different applications, namely: 1. Conversion of the hemicellulose content of sugar cane bagasse to 5-carbon sugars by mild-acid prehydrolysis, followed by fermentation of the 5-carbon sugar extract with recombinant Escherichia coli in a commercial installation soon to be under construction in Brazil. This unique process utilizes the surplus hemicellulose fraction of bagasse not required for steam and power generation to ***produce*** ***ethanol*** , additional to that from the original cane juice, which has been converted by conventional sucrose fermentation to ethanol. The process also recovers and converts to ethanol the majority of sucrose normally lost with the bagasse fibers. Resultant ***beer*** is enriched in an innovative process to eliminate the need for incremental rectification capacity. 2. Application of this technology to mixed waste paper in Florida, with a moderate loading of newsprint (85% mechanical wood fiber), will involve a mild-acid prehydrolysis, the partial extraction of the 5-carbon sugars produced from hemicellulose as a feedstock for propagation of the recombinant Klebsiella oxytoca bacterium. Included is a facility providing for in-house production of cellulase enzyme, as an active whole broth for direct use in simultaneous saccharification and fermentation (SSF) of the remaining cellulose and residual 5-carbon sugars to ethanol. This is followed by distillation and dehydration in the advanced commercially available low-energy recovery system. 3. Another potential application of this unique technology involves utilization of a variety of wastes from several pulp and paper mills in close proximity, permitting collection of these wastes at low cost and reducing the considerable cost encountered in disposing of such low-energy wet waste. Based on pilot plant experiences with converting such waste by simultaneous enzymatic hydrolysis and fermentation, the same techniques will be applied as in the second case, with use of acid prehydrolysis only if the hemicellulose derived sugars can be economically recovered. If not, acid hydrolysis will be eliminated and only the simultaneous saccharification and fermentation will be carried out, utilizing in-house-produced enzyme broth and recombinant Klebsiella oxytoca.

L3 ANSWER 6 OF 28 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN

AB A total of 12 yeast strains from various genera were examined for their ability to ***produce*** ***ethanol*** in the presence of high concentrations of glucose. From these studies, the yeasts Torulaspora delbrueckii and Zygosaccharomyces rouxii were observed to be the most osmotolerant. These osmotolerant yeast strains were also observed to possess high concentrations of intracellular trehalose. Furthermore, these strains were found to be tolerant to long-term storage at -20.degree. C and to storage at 4.degree. C in ***beer*** containing 5% (v/v) ethanol. Cells containing high trehalose levels at the time of freezing or cold storage exhibited the highest cell viabilities. Trehalose concentration was observed to increase during growth on glucose, reaching a maximum after 24-48 h. Increasing the incubation temperature from 21 to 40.degree. C also resulted in an increase in intracellular trehalose content. These results suggest that trehalose plays a role in enhancing yeast survival under environmentally stressful conditions.

L3 ANSWER 7 OF 28 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN
AB Fermentation of sugars in the brewing industry and other fermentation-based industries is generally carried out by yeasts that produce 40-90 g/L ethanol as limited by the amount of available carbohydrate. Over the years, there has been incrasing interest in high-gravity fermentations with resultant increases in final ethanol concentration. Various species of Saccharomyces and other yeast genera were examined for their ability to ***produce*** ***ethanol*** in the presence of high concentrations of substrate. From these studies, a number of yeasts were recognized for their ethanol tolerance and for their ability to grow and ferment in 400, 500, and 600 g/L of glucose media. These strains were fused with various strains of Saccharomyces, and the resulting fusion products were compared with their parental strains. The fusion products were found to possess superior fermentation profiles in high-gravity media. Thus, spheroplast fusion is a valuable tool for obtaining novel yeast strains with enhanced fermentation characteristics.

L3 ANSWER 8 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB A review. ***Beer*** is one of the most ancient beverages and its compn. has evolved very little over the years. It is still made from four fundamental components: barley, hop, yeast and water that undergo very strict selection and control procedures to ensure the quality and diversity of the beverage. Due to the multiple combination possibilities of these raw materials, brewers can produce a ***beer*** with specific characteristics and flavours using a three-step manufg. process. Barley is transformed into malt, through malting, to stimulate its enzymic activity necessary for brewing. During the brewing process the products present in the malt become sol. and a sweet wort is obtained which is used by the yeast as a substrate during fermn. to ***produce*** ***alc*** . and carbon dioxide. Finally, the ***beer*** is filtered before packaging.

L3 ANSWER 9 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB S. cerevisiae NF I-1 mutant grows and ***produces*** ***ethanol*** in the presence of O. The S. cerevisiae NF I-1 mutant is obtained by mutation with EMS and selection in a medium contg. cycloheximide. The S. cerevisiae mutant is useful for manuf. of ethanol and alc. beverages by aerobic fermn.

L3 ANSWER 10 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB A review. Saccharomyces cerevisiae is the main microorganism used in alc. beverage brewing, because this microbe has alc. dehydrogenase (ADH) activity. The authors have recently discovered that some genera of mushrooms ***produce*** ***alc*** . dehydrogenase, and made wine, ***beer*** and sake using mushrooms in place of S. cerevisiae. The highest alc. concns. in the wine, ***beer*** and sake were achieved with Pleurotus ostreatus (2648 mM, 12.2%), Tricholoma matsutake (1069 mM, 4.6%) and Agaricus blazei (1736 mM, 8.0%). In the case of wine made using A. blazei, the same alc. concn. (1736 mM, 8.0%) was produced under both aerobic and anaerobic conditions. This wine produced by A. blazei contained about 0.68% .beta.-D-glucan, which is known to have preventive effects against cancer. The wine made using Flammulina velutipes showed thrombosis-preventing activity, giving a prolonged thrombin clotting time 2.2-fold that of the control. Thus, alc. beverages made using mushrooms seem to be a functional food source which can be expected to have preventive effects against cancer and thrombosis.

L3 ANSWER 11 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB Microorganisms transformed with gene ATF2 (encoding alc. acetyltransferase activity) are used to ***produce*** ***alc*** . beverages with elevated levels of acetyl esters, but with limited amts. (10-150 mg/L) of undesirable esters, esp. Et acetate. Thus, Muscat musts fermented with wine yeasts expressing ATF1 or ATF2 are characterized by enhanced levels

of isoamyl acetate, 2-phenylethyl acetate and geranyl acetate, but amts. of Et acetate are at least 4 times lower in strains expressing ATF2 vs. those with ATF1. ATF2 gave wines with a fruity aroma and the solvent note (particularly assocd. with ATF1) was minimized.

L3 ANSWER 12 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB The Food and Drug Administration (FDA) is amending the food additive regulations to provide for the safe use of .alpha.-acetolactate decarboxylase (.alpha.-ALDC) enzyme prepn. derived from Bacillus subtilis, modified by recombinant DNA techniques to contain the gene coding for .alpha.-ALDC from B. brevis, for use as a processing aid to ***produce*** ***alc*** . malt beverages and distd. liquors. This action is in response to a petition filed by Novozymes North America, Inc. (formerly Novo Nordisk Bioindustrials, Inc.).

L3 ANSWER 13 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB In general, Saccharomyces cerevisiae is the main microorganism used in brewing because it has a potent ability to ***produce*** ***alc*** . dehydrogenase. Some genera of mushroom ***produce*** ***alc*** . dehydrogenase and the authors made a ***beer*** -like drink using a mushroom in place of S. cerevisiae. The highest alc. concn. in this drink was achieved with Tricholoma matsutake (1069 mM, 4.6%). This ***beer*** -like drink contained about 0.17% .beta.-D-glucan, which is known to have preventive effects against cancer. The drink showed thrombosis preventing activity: it prolonged thrombin clotting time 2.3 fold vs. a control.

L3 ANSWER 14 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB A new math. model for ***beer*** fermn. based on knowledge of biochem. pathways is discussed. The model is subdivided into a growth model (sugar consumption, biomass ***prodn*** ., ***alc*** . prodn., temp. and CO2 release), an amino acid model, and a flavor/aroma model (alcs., esters, and vicinal diketones). The new model was useful for online estn., prodn. control, and process optimization.

L3 ANSWER 15 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB The process of the obtaining of the hop exts., techniques of extn. of hop with ethanol and liq. CO2 and comparison of the both exts. are described. Advantages of ethanol exts. and using them in the ***beer*** prodn.

L3 ANSWER 16 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB A review with 10 refs. The division of the carbon fluxes in the metab. of sugars by yeasts over the various routes (i.e. respiration, alc. fermn., and biomass formation) is dependent on the species and on environmental parameters. These latter include, for example, the oxygen concn., the concn. of the sugar, the nature of the sugar and the presence of weak acids in the medium. A better understanding of the biochem. background of the regulation of metabolic fluxes in yeasts is of obvious importance for the biotechnol. applications of these organisms: ***beer*** and bakers' yeast ***prodn*** ., ***alc*** . fermn. of waste material, and the prodn. of heterologous proteins. In this paper some recent results of studies on the effects of environmental factors on metabolic fluxes in yeasts are presented.

L3 ANSWER 17 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB Yeast cells are immobilized on a substantially noncompressible carrier having anion-exchange properties. The immobilized yeast can then be used to ferment a sugar-contg. substrate and the immobilized yeast carrier can be regenerated. Thus, brewers' yeast was immobilized on 2 resins with anion exchange functionality. The resins were: granulated DEAE-cellulose having the trademark Spezyme GDC 220 and a synthetic anion-exchange resin having the trademark Duolite A 568. The immobilizations were performed according to the following procedure. The yeast was incubated for 48 h in a malt ext. broth at 30.degree.. The resin was sterilized by washing with

1M sodium hydroxide, buffered to pH 5.0-5.1 and washed with sterile water. A 10 g dry wt. sample of the resin was flushed in a 20 mm i.d. glass column equipped with a glass sinter bottom plate. About 100 mL of the yeast suspension was passed by gravity through the column at an approx. rate of 3 bed vols./h, after which the column was washed with 100 mL of sterile water. The immobilized yeasts were successfully used for prodn. of ***beer*** , sake, and mead.

L3 ANSWER 18 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB A kit contg. yeast and an effervescing system in powder form for home fermn. to ***produce*** ***alc*** . beverage is described. ***Beer*** was manufd. by adding water to a kit contg. fermn. solids 1268 and NaHCO3 12 and tartaric acid 11 g as an effervescing system to make up a total vol. of 12 L. After standing for 14 h, the solids dispersed uniformly in the mixt. at pH 4.9 at both the top and the bottom.

L3 ANSWER 19 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB An app. is described in which sieve plates are arranged in 2 phase contact zones for fractionation of ***beer*** and alc. beverages to ***produce*** ***alc*** . with minimal amts. of impurities.

L3 ANSWER 20 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB At. absorption analyses of >130 ***beers*** and spirits from different parts of Africa, India, Europe, and Canada were made for 4 heavy metal contaminants. A high proportion of home- ***produced*** ***alc*** . drinks, including distd. spirits, contained Zn 0.10-68.0, Fe 0.2-245, and Cu 0.10-58.0 mg/l. Little Pb was found. The metals were traced largely to the use of galvanized metal fermn. drums which have replaced clay and wooden vessels.

L3 ANSWER 21 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB ***Beer*** or wine is contacted under pressure with one face of a semi-permeable membrane (polyvinyl acetate, polyacrylates, or modified cellulose). The fraction contg. the greater proportion of dissolved solids remains as a conc. on one side and on the other side is the percolate. The fractions may be recombined to reconstitute the beverage. The conc. also may be shipped and reconstituted on reaching its destination by the addn. of water and locally ***produced*** ***alc*** . Thus, 30 l. of ***beer*** having an alc. content of 7.9% by vol. and a dissolved solids content of 6% by wt. was passed through a porous cylindrical tube, the inside surface of which was coated with a Mg(ClO4)2-treated cellulose acetate membrane. A pressure differential of 850 lb/sq. in. was maintained between the inner part of the tube and its outer surface. The tube was 3129 cm long and had a 1.27 cm internal diam. The liq. that passed through the membrane was collected. The liq. remaining in the tube was recirculated through the tube. During 2.08 hr the vol. of the percolate was 23.6 l. and the alc. concn. of the percolate was 8%. The percolate contained less than 0.1% of dissolved solids. The degree of concn. of dissolved solids in the conc. was 4.7 times that in the original ***beer*** . When the conc. was dild. back to the color of the original ***beer*** (4.5-fold), the product was a low-alc. . ***beer*** of interesting flavor.

L3 ANSWER 22 OF 28 CAPLUS COPYRIGHT 2007 ACS on STN
AB A yeast (somewhat similar to Klocker's Willia Saturna, but with certain distinct differences) which secreted invertase and ***produced*** ***alc*** . fermentation, but had no action on lactose, galactose, maltose, starch, or egg albumin was isolated from the juice of banana leaves; this yeast was always accompanied by a bacterium. Cultures of the yeast on gelatin (with ***beer*** wort) had a peculiar aromatic odor resembling that of the pineapple.

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L3 ANSWER 24 OF 28 EMBASE

AB ***Beer*** is one of the most ancient beverages and its composition has evolved very little over the years. It is still made from four fundamental components: barley, hop, yeast and water that undergo very strict selection and control procedures to ensure the quality and diversity of the beverage. Due to the multiple combination possibilities of these raw materials, brewers can produce a ***beer*** with specific characteristics and flavours using a three-step manufacturing process. Barley is transformed into malt, through malting, to stimulate its enzymatic activity necessary for brewing. During the brewing process the products present in the malt become soluble and a sweet wort is obtained which is used by the yeast as a substrate during fermentation to ***produce*** ***alcohol*** and carbon dioxide. Finally, the ***beer*** is filtered before packaging.

L3 ANSWER 25 OF 28 EMBASE

AB Saccharomyces cerevisiae is the main microorganism used in alcoholic beverage brewing, because this microbe has alcohol dehydrogenase (ADH) activity. We have recently discovered that some genera of mushrooms ***produce*** ***alcohol*** dehydrogenase, and made wine, ***beer*** and sake using mushrooms in place of S. cerevisiae. The highest alcohol concentrations in the wine, ***beer*** and sake were achieved with Pleurotus ostreatus (2648mM, 12.2%), Tricholoma matsutake (1069mM, 4.6%) and Agaricus blazei (1736mM, 8.0%). In the case of wine made using A. blazei, the same alcohol concentration (1736mM, 8.0%) was produced under both aerobic and anaerobic conditions. This wine produced by A. blazei contained about 0.68% .beta.-D-glucan, which is known to have preventive effects against cancer. The wine made using Flammulina velutipes showed thrombosis-preventing activity, giving a prolonged thrombin clotting time 2.2-fold that of the control. Thus, alcoholic beverages made using mushrooms seem to be a functional food source which can be expected to have preventive effects against cancer and thrombosis.

L3 ANSWER 26 OF 28 EMBASE

AB Background. This study is concentrated on an improvement of ***beer*** fermentation under very high gravity (VHG) conditions using immobilised bottom-fermenting yeast strain Saccharomyces cerevisiae. Methods. The yeast cells, free or immobilised in calcium alginate, calcium pectate, k-carrageenan, agar or DEAE-cellulose, were used for batch wort fermentation of different gravity - 12 to 30% (w/w). A significant increase of fermentation rate of VHG wort for yeasts entrapped in calcium pectate or calcium alginate in comparison to free cells was observed. Results. The specific rates of saccharides utilisation and ethanol production of free yeasts and yeasts immobilised on DEAE-cellulose were very similar at all concentrations of wort and were reduced, as compared to yeasts immobilised in other carriers studied. Ethanol toxicity affects

mainly the cell membrane by altering the lipid bilayer and thus weakening the structure. The yeast responds by increasing its intracellular contents as well as the unsaturated fatty acid concentration. Increasing concentration of ***produced*** ***ethanol*** decreased the relative percentage of saturated fatty acids, especially palmitic (16:0) and stearic (18:0), more in free and on DEAE-cellulose immobilised cells than in yeast immobilised by entrapment. Conclusions. The results confirm that immobilisation protects the microbial cells against the possible toxic effect of substrates or products whereby entrapment in gel appeared to be more favourable than adsorption. If the gel matrix contained calcium cations, the ethanol tolerance was even more improved.

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AB A total of 12 yeast strains from various genera were examined for their ability to ***produce*** ***ethanol*** in the presence of high concentrations of glucose. From these studies, the yeast Torulaspora delbrueckii and Zygosaccharomyces rouxii were observed to be the most osmotolerant. These osmotolerant yeast strains were also observed to possess high concentrations of intracellular trehalose. Furthermore, these strains were found to be tolerant to long-term storage at -20.degree.C and to storage at 4.degree.C in ***beer*** containing 5% (v/v) ethanol. Cells containing high trehalose levels at the time of freezing or cold storage exhibited the highest cell viabilities. Trehalose concentration was observed to increase during growth on glucose, reaching a maximum after 24-48 h. Increasing the incubation temperature from 21 to 40.degree.C also resulted in an increase in intracellular trehalose content. These results suggest that trehalose plays a role in enhancing yeast survival under environmentally stressful conditions.

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AB About 2 million dry metric tons of fruit and vegetable wastes are produced annually. This may be converted to 809.2 million liters of ethanol using conventional ethanol production methods. However, distillation of dilute ***beers*** or ***beers*** of viscous, thick, or fibrous nature pose some difficulties. At present, ethanol production can compete economically with other waste handling alternatives in only a few situations. In many instances, food wastes with the most potential are already being used to ***produce*** ***ethanol*** or have been evaluated for ethanol production and found to be uneconomical. Integrated systems that also produce methane appear to have significant potential for ethanol production. Further growth in ethanol markets and increasing environmental regulations controlling waste disposal will enhance the possibilities of ethanol production.

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=> s (mash or mashed or mashing) (w) process
L4          348 (MASH OR MASHED OR MASHING) (W) PROCESS

=> s l4 and barley (w) malt
L5           22 L4 AND BARLEY (W) MALT

=> s l5 and acid(w)alpha()amylase and enzymer
L6            0 L5 AND ACID(W) ALPHA(W) AMYLASE AND ENZYMER

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L7            0 L5 AND ACID(W) ALPHA(W) AMYLASE AND ENZYME

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L8            0 L5 AND ACID(W) ALPHA(W) AMYLASE AND ENZYME

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L5 ANSWER 1 OF 22 MEDLINE on STN
AB A mathematical model describing the degradation of arabinoxylans by endo-xylanase during ***mashing*** ***process*** was developed. Endo-xylanase activities and arabinoxylans concentrations in laboratory scale ***mashing*** ***process*** at different temperature profiles were measured and then used for identifying the model parameters for Harrington ***barley*** ***malt*** . The modeling errors range for the final concentration of arabinoxylans in wort was -4% to +11.9%. The model developed was also used for predicting the other three different malts ***mashing*** ***processes*** in laboratory scale, and the prediction errors ranged from -9.5% to +13.6%. The model prediction accuracy for industrial scale ***mashing*** ***process*** was lower than that in laboratory scale. The simulation results showed that, a lower concentration of arabinoxylans could be achieved when maintaining the mashing-in at 45 degrees C and prolonging the mashing-in time.

L5 ANSWER 2 OF 22 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN
AB beta-Glucanase from ***barley*** ***malt*** is known to be thermolabile but important in the ***mashing*** ***process*** . Therefore, the potential of increasing the thermostability of beta-glucanase in ACES buffer (0.1 M, pH 5.6) by high hydrostatic pressure has been invest-tigated. Inactivation of the enzyme as well as changes of the conversion rate in response to combined pressure-temperature treatments in the range of 0.1-900 MPa and 30-75 degrees C were assessed by analyzing the kinetic rate constants. A significant stabilization of beta-glucanase against temperature-induced inactivation was detected at 400 MPa. With increasing pressure up to 600 MPa the catalytic activity of beta-glucanase was progressive, ly decelerated. However, for the overall depolymerization reaction of beta-glucans in ACES buffer (0.1 M, pH 5.6) a maximum was identified at 215 MPa and 55 degrees C yielding approximately 2/3 higher degradation of beta-glucan after 20 min as compared to the maximum at ambient pressure (45 degrees C).

L5 ANSWER 3 OF 22 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN
AB A mathematical model describing the degradation of arabinoxylans by endo-xylanase during ***mashing*** ***process*** was developed. Endo-xylanase activities and arabinoxylans concentrations in laboratory scale ***mashing*** ***process*** at different temperature profiles were measured and then used for identifying the model parameters for Harrington ***barley*** ***malt*** . The modeling errors range for the final concentration of arabinoxylans in wort was -4% to +11.9%. The model developed was also used for predicting the other three different malts ***mashing*** ***processes*** in laboratory scale, and the prediction errors ranged from -9.5% to +13.6%. The model prediction accuracy for industrial scale ***mashing*** ***process*** was lower than that in laboratory scale. The simulation results showed that, a lower concentration of arabinoxylans could be achieved when maintaining the mashing-in at 45degreeC and prolonging the mashing-in time.

L5 ANSWER 4 OF 22 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN
AB The effect of milling parameters on the hydrolysis of starch during the ***mashing*** ***process*** was investigated. Hammer milling was compared against roll milling. Roll gap settings, roll speed, speed differential were also analysed, as well as comparing four- to six-roll milling. The parameter of differential speed was also studied through grist particle size distribution. Employing a 65 degreeC infusion type ***mashing*** ***process*** for the wort, the glucose and maltose concentrations of malts milled in different ways were analysed. Results showed that the glucose concentration in the wort after 45 min of mashing, obtained using a hammer mill, was the same as that achieved from roll milling in 60 min. For roller mill gap settings the 0.8 mm gap grist required 60 min of mashing to reach a glucose concentration of 3.46 g l-1,

whereas the 0.1 mm gap grist achieved the same level of starch hydrolysis in almost half the time, around 30-35 min of mashing. The results regarding roll speed showed that the 300 and 700 rpm mashes required roughly 50 and 40 min, respectively. Comparable sugar concentrations in the 50 rpm mash were obtained in 60 min. Finally, the comparison between simulated four- and six-roll milling showed the latter yielded higher glucose concentrations.

L5 ANSWER 5 OF 22 BIOSIS on STN
AB Steam may offer several advantages for commercial brewers as well. For those mashing in unheated tuns, direct steam injection might be a low-cost method of adding heating capability to the tuns for stepped mashes. This might be especially economical for those breweries that already use steam as a source of heat for the kettle. Furthermore, direct injection of steam offers certain advantages over steam jacketed tuns. The heat transfer rate will be higher, because of the absence of an intervening wall between the steam and the mash. Also, because the steam is injected directly into the bulk of the mash rather than at the periphery, the heat distribution will tend to be more even and require less stirring. This method was tested and the results are reported in this paper.

L5 ANSWER 6 OF 22 BIOSIS on STN
AB The fate of lipids during mashing of malt is not an unambiguously resolved question. To gain insight into the behavior of lipids during mashing, lipid reactions were studied in aqueous slurries of ***barley*** , ***malt*** , and samples taken during malting and in different ***mashing*** ***processes*** . An ability for lipid hydrolysis increased as the malting process progressed, being most significant in samples taken during kilning and from malt. However, although lipolysis occurred in the aqueous slurries, a corresponding accumulation of free fatty acids (FFA) could not be detected when assayed by conventional extraction methods. As a consequence, an apparent reduction of total lipids occurred. On the other hand, the use of more destructive methods for analysis revealed that upon hydrolysis the liberated fatty acids enter a nonextractable, protective complex phase. The results of the present study suggest that the FFA liberated during mashing are complexed and carried out of the process with spent grains without extensive oxidation.

L5 ANSWER 7 OF 22 BIOSIS on STN
AB The temperature programmed mashing profile for ***barley*** ***malt*** employed by most breweries in Nigeria was adapted for the mashing of sorghum malt. The effect of the addition of maize grits as an adjunct during the ***mashing*** ***process*** was also examined. The unhopped wort obtained was lower in extract, fermentable sugars and nitrogen than the commercial wort. However, the use of 10 to 25% maize grits as adjunct improved the properties of the sorghum malt wort. Twenty to 25% adjunct appeared to be the optimum. The beer produced from the fermented wort gave apparent extract, real extract, alcohol by weight, colour, pH, titratable acidity, fermentable sugars and caloric levels similar to those of a commercial beer.

L5 ANSWER 8 OF 22 CAPLUS on STN
AB During the ***mashing*** ***process*** for beer prodn., intact starch granules can not be hydrolyzed below the gelatinization temp. in an appropriate time. This is an important fact, when adjunct is used. The inactivation temps. of amylolytic enzymes of ***barley*** ***malt*** are about 70 .degree.C for .beta.-amylase and 80 .degree.C for .alpha.-amylase. To guarantee sufficient starch degrdn. to fermentable sugars, gelatinization has to take place prior to amylolysis. For an optimized ***mashing*** ***process*** the gelatinization temp. is an important specification. Still it is not a recommended method in the brewing industry. In this work we used a method that is established in

other industries. We analyzed different cereals and pseudocereals that could be used as adjunct for the brewing process. Further mashing trials were done on different rice samples to demonstrate the importance of the gelatinization temp. in terms of brew house yield and wort quality.

L5 ANSWER 9 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN
AB .beta.-Glucanase from ***barley*** ***malt*** is known to be thermolabile but important in the ***mashing*** ***process*** . Therefore, the potential of increasing the thermostability of .beta.-glucanase in ACES buffer (0.1 M, pH 5.6) by high hydrostatic pressure was investigated. Inactivation of the enzyme as well as changes of the conversion rate in response to combined pressure-temp. treatments in the range of 0.1-900 MPa and 30-75.degree.C were assessed by analyzing the kinetic rate consts. A significant stabilization of .beta.-glucanase against temp.-induced inactivation was detected at 400 MPa. With increasing pressure up to 600 MPa the catalytic activity of .beta.-glucanase was progressively decelerated. However, for the overall depolymn. reaction of .beta.-glucans in ACES buffer (0.1 M, pH 5.6) a max. was identified at 215 MPa and 55.degree.C yielding approx. 2/3 higher degrdn. of .beta.-glucan after 20 min as compared to the max. at ambient pressure (45.degree.C).

L5 ANSWER 10 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN
AB A review. During seed germination several seed biopolymers, including the storage proteins, must be hydrolyzed to provide biochem. building blocks for the growing seedling. This process is particularly important in barley because under the guise of 'malting', it forms the basis of the malting and brewing industries. The steps involved in the enzymic formation of 'sol. protein' during malting and in the 'mashing' phase of brewing are still not well understood. The barley proteins are initially solubilized by endoproteases and then further degraded by exopeptidases. The cysteine-class proteases probably play the most important roles, but their contributions are likely not as overwhelming as was thought previously. The metalloproteases are apparently also important players in protein solubilization, although their contributions have scarcely been examd. The characteristics of the purified aspartic class proteases imply that they are not important contributors to protein solubilization, but recent mashing studies indicate that they probably do play a minor role. All indications are that the barley and malt serine class proteases are not directly involved in storage protein hydrolysis during malting/mashing. More studies are needed to clarify the roles of the aspartic- and metalloproteases. One important aspect of further studies should be to ensure that appropriate biochem. methods are used, as well as conditions that are truly appropriate to com. malting and ***mashing*** ***processes*** .

L5 ANSWER 11 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN
AB A math. model describing the degrdn. of arabinoxylans by endo-xylanase during ***mashing*** ***process*** was developed. Endo-xylanase activities and arabinoxylans concns. in lab. scale ***mashing*** ***process*** at different temp. profiles were measured and then used for identifying the model parameters for Harrington ***barley*** ***malt*** . The modeling errors range for the final concn. of arabinoxylans in wort was -4% to +11.9%. The model developed was also used for predicting the other three different malts ***mashing*** ***processes*** in lab. scale, and the prediction errors ranged from -9.5% to +13.6%. The model prediction accuracy for industrial scale ***mashing*** ***process*** was lower than that in lab. scale. The simulation results showed that, a lower concn. of arabinoxylans could be achieved when maintaining the mashing-in at 45.degree. and prolonging the mashing-in time.

L5 ANSWER 12 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN

AB The fate of lipids during mashing of malt is not an unambiguously resolved question. To gain insight into the behavior of lipids during mashing, lipid reactions were studied in aq. slurries of ***barley*** , ***malt*** , and samples taken during malting and in different ***mashing*** ***processes*** . An ability for lipid hydrolysis increased as the malting process progressed, being most significant in samples taken during kilning and from malt. However, although lipolysis occurred in the aq. slurries, a corresponding accumulation of free fatty acids (FFA) could not be detected when assayed by conventional extn. methods. As a consequence, an apparent redn. of total lipids occurred. On the other hand, the use of more destructive methods for anal. revealed that upon hydrolysis the liberated fatty acids enter a nonextractable, protective complex phase. The results of the present study suggest that the FFA liberated during mashing are complexed and carried out of the process with spent grains without extensive oxidn.

L5 ANSWER 13 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN

AB The malting and brewing characteristics of millets (P. typhoides and D. exilis) and sorghum (S. bicolor) were compared. Diastase, .alpha.-amylase, amyloglucosidase, and proteases increased with malting time and the increase was assocd. with the modification. Development of hydrolytic enzymes was significantly higher in pearl millet and D. exilis (acha) than in sorghum. The major starch degrading enzyme in the three varieties of pearl millet (SE composite, SE.13, and SE 2124) was .alpha.-amylase. On the other hand, .beta.-amylase was the major starch-degrading enzyme in acha which is similar to the pattern in barley. Gibberellic acid had a stimulating effect on the diastatic activity of pearl millets, acha, and sorghum (KSV-4), but inhibited the diastatic activities of sorghum (Farafara). Gibberellic acid inhibited the proteolytic activities in all the pearl millet varieties, D. exilis, and sorghum varieties. Potassium bromate had little or no effect in the redn. of malting losses. Although acha had a high .beta.-amylase content, a high malting loss makes it uneconomical to brew with acha malt. A blend of acha malt with pearl millet malt or sorghum malt (composite malt) will produce a malt of the same profile as ***barley*** ***malt*** , and this will enhance the quality of sorghum and pearl millet malt during the ***mashing*** ***process*** . Wort quality of all the samples was suitable for brewing conventional beer.

L5 ANSWER 14 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN

AB The oxidative stability of barley and malt was studied by analyzing changes in their lipid content and compn. at the early stages of mashing as simulated by a 15-h soaking in water. When malt flour was soaked in water at 23.degree., the amt. of triglycerides (TG) and polar lipids (PL) was reduced and the content of free fatty acids (FFA) increased, indicating that lipid hydrolysis occurred. During soaking, the proportion of linoleic acid in the FFA fraction of malt lipids increased slightly. Following similar soaking of barley flour, TG and PL were similarly reduced but the accumulation of FFA and esp. that of linoleic acid was very low. The changes in lipids were compared to the levels of lipoxygenase (LOX) in barley and malt. It was found that LOX activity of barley was very high, 450-1150 U/100 mg, depending on the variety. The LOX activity of malt was only 5% of the activity of barley. The data suggest that the oxidn. of LOX is negligible in the malt samples even in the FAA fraction. However, the majority of barley fatty acids are polyunsatd. and their liberation during soaking in the presence of LOX caused oxidn. and influenced the lipid quality of wort.

L5 ANSWER 15 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN

AB The temp. programmed mashing profile for ***barley*** ***malt*** employed by most breweries in Nigeria was adapted for the mashing of sorghum malt. The effect of the addn. of maize grits as an adjunct during the ***mashing*** ***process*** was also examd. The unhopped wort

obtained was lower in ext., fermentable sugars and N than the com. wort. However, the use of 10-25% maize grits as adjunct improved the properties of the sorghum malt wort. Twenty to 25% adjunct appeared to be the optimum. The beer produced from the fermented wort gave apparent ext., real ext., alc. by wt., color, pH, titratable acidity, fermentable sugars, and caloric levels similar to those of a com. beer.

L5 ANSWER 16 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN
AB Frozen beer ppts. were usually formed when beer was kept for several days at -8 to -13.degree.. The ppts. were composed mainly of .beta.-glucans, and their mol. wts. ranged from 106 to 103. The high mol. wt. fraction (mol. wt. 106 to 105) was similar to native barley .beta.-glucans, which have a ratio of .beta.-(1-3) to .beta.-(1-4) linkages of about 30:70. The medium mol. wt. fraction (mol. wt. 105 to 104) had a ratio of about 25:75, whereas the lower mol. wt. fraction (mol. wt. 104 to 103) was mostly composed of .beta.-glucan with .beta.-(1-4) linkages. In brewing ***barley*** ***malt*** , 2 kinds of enzymes that catalyze degrdn. of .beta.-glucan were found, .beta.-(1-4)-D-glucanase (I) and (II). These enzymes can also synthesize .beta.-(1-4) linkages. For example, .beta.-(1-4)-D-glucanase(I) is able to transfer the cellotriose moiety to the nonreducing end glucosyl residue of another oligosaccharide to form insol. .beta.-glucan. Lower and medium mol. wt. fractions were estd. to be formed by both degradative and transferase-type reactions during the malting and ***mashing*** ***process*** . The soly. of .beta.-glucan decreased with increasing ratios of the .beta.-(1-4) linkage in .beta.-glucan. In fact, the lower mol. wt. fractions had lower solubilities than the high mol. wt. fractions. The mechanisms of formation of frozen beer ppts. were estd. to be via increases in the alc. concn. caused by the freeze concn. phenomenon. Consequently, the low soly.-lower mol. wt. fraction ppts. and promotes the subsequent pptn. of high mol. wt. fractions.

L5 ANSWER 17 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN
AB Provided the malt from multirowed barley makes up no more than half the total malt quantity, the usual range of N concns. is obtainable; the taste of the beer from a malt with higher N concn. was in no way inferior. Provided the ***mashing*** ***process*** , when using multirowed barley, is suitably modified, the level of mashing loss is lower, and the process time is shorter, and mashing capacity is increased. Where barley is used in malting instead of maize or rice, a considerable quantity of .beta.-amylase is already present before mashing, and provided too high a temp. does not destroy the enzyme, the starch to sugar conversion is intensified, this is even more so when multirowed barley is used. Multirowed barley is even more advantageous when mashing with microbial enzymes, without malting, where there is a contribution from the enzymes from barley. Multirowed barley can be used in brewing, provided the process is suitably modified.

L5 ANSWER 18 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN
AB This paper describes important investigations of the proteins of ***barley*** , ***malt*** , and beer as conducted in Scandinavian brewing labs. in recent years. A brief review of the literature is presented. The data are discussed with regard to the importance of N compds. in relation to the stability of beer. The fractionation of barley globulin according to the method of Quensel (Dissertation, 1942, and C.A. 32, 5991.5) is described in detail, and the variation in globulin compn. of barley is critically discussed. Sedimentation diagrams of globulins of barley and malt are presented in 4 curves. Current developments on the condition of the globulins during the ***mashing*** ***process*** , the relation of chill turbidity and globulin in beer, oxidation turbidity, and foam characteristics as influenced by chill haze are presented.

L5 ANSWER 19 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN

AB The addn. of pyrogallol to barley and malt exts. greatly intensifies the coloring due to O2 which is hardly measurable in unaltered worts or mashes. As a result the reaction can be measured under a variety of conditions. A heat-stable and a heat-labile component are responsible for the reaction. Both are inhibited by KCN. The general reaction is dependent on pH. Between pH 5 and 6.3 it is scarcely measurable whereas an optimum is observed at pH 7.9 to 8.3. The pH curves of the 2 sep. components are more or less similar to that of the combination. Exts. of barley and malt behave alike. At the pH optimum the temp. optimum is between 20.degree. and 40.degree.. At 80.degree. the reaction is too slow to measure. The heat-labile component is rapidly destroyed at 85.degree.. Ascorbic acid is observed to be quite similar to pyrogallol as a substrate. At pH 6 normal mashes and malt worts show very little activity and this explains the negligible O2 coloration in the ***mashing*** ***process*** .

L5 ANSWER 20 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN
AB Brew-house yield (2- ***mash*** ***process***) may be predicted from barley protein alone with considerable accuracy, but a significant influence of 1000 corn wt. or hl. wt. could not be shown. With the malt itself, analysis of 40% grist gives more useful results than analysis of meal or of coarse grist. Analysis of Congress wort allows prediction of total N of wort and beer, and the individual N fractions and inorg. phosphate of cast wort are related to those of Congress wort. Some relationship also exists between viscosity of wort and that of beer; the colors show little relationship. The lack of concordance between the various methods for assessing malt modification is noted, but modifications of technique are necessary (and beer quality is affected) only when differences are large.

L5 ANSWER 21 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN
AB The favorable results in the ***mashing*** ***process*** are attributed to the high liquefying activity of oats malt; its saccharifying ability, even though lower than that of ***barley*** ***malt*** , is sufficient for complete conversion and high yield.

L5 ANSWER 22 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN
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=> s l5 and acid(w)alpha(w)amylase and protease or cellulase
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=> s l5 and acid(w)alpha(w)amylase and cellulase
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L5 ANSWER 19 OF 22 CAPLUS COPYRIGHT 2007 ACS on STN
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IT Barley
Malt
Worts
(oxidases in)

IT 9035-73-8, Oxidase
(in ***barley*** , ***malt*** and wort)